



MHP10 SERIES

Single and dual output

- **2 x 1 x 0.4 inch package**
- **12.5 Watts/in³ power density**
- **32 models including 3.3VDC and 2.1VDC**
- **Designed to meet EN60950**
- **Indefinite short circuit protection**
- **Optional remote ON/OFF**
- **Optional trim output**

The MHP10 series of DC/DC converters, comprising 32 different models, has been designed for a wide range of applications including communications, industrial systems and mobile battery powered systems. Packing 10 Watts of power into a 2 x 1 x 0.4 inch package, with efficiencies as high as 80% the MHP10 has wide input ranges of 4.5-9VDC, 9-18VDC, 18-36VDC and 36-72VDC and is available in both single and dual output versions. Other features include indefinite short circuit protection with automatic recovery and remote on/off, all of which minimize the need for external circuitry and make the MHP10 a recommended component in distributed power systems.

[2 YEAR WARRANTY]

SPECIFICATION

All specifications are typical at nominal input, full load at 25°C unless otherwise stated

Voltage adjustability	See Note 3	±10%
Line regulation	LL to HL, all outputs	±0.1%
Load regulation	ML to FL Single outputs Dual outputs	±0.1% ±1.0%
Cross regulation	Asymmetrical load 25% / 100% FL	5.0% max.
Voltage accuracy		±2.0%
Minimum load	2.1V, 3.3V, 5V Single 12V, 15V Duals: each output	50mA max. 80mA max. 10% FL
Overshoot	At start-up	3.0% max.
Ripple and noise	20MHz bandwidth	1.5% pk-pk, max. 20mV rms
Transient response	25% load step	±10% typ. max. dev., 0.5ms recovery to within ±1.0%
Temperature coefficient		±0.02%/°C
Short circuit protection	Hiccup mode See Note 5	Continuous automatic recovery
Input voltage range	5VDC, nominal, FL 12VDC nominal, FL 24VDC nominal, FL 48VDC nominal, FL	4.5 to 9VDC 9 to 18VDC 18 to 36VDC 36 to 72VDC
Input filter		PI filter
Input current		See table
Input reflected ripple	Single output Dual outputs	200mA 200mA
Start-up time		500ms

INPUT SPECIFICATIONS CONTINUED		
Remote ON/OFF Logic compatibility		CMOS/TTL, See Note 4
ON		3.5VDC min. or open
OFF		0.8VDC max.
GENERAL SPECIFICATIONS		
Efficiency		78% typ.
Isolation voltage	Input/output	500VDC
Isolation capacitance	Input/output	1nF
Switching frequency	Fixed	200 to 275kHz
Approvals and standards (pending)	Safety	VDE0805, EN60950, IEC950 UL1950, CSA C22.2 No. 950
Case material		Black coated, metal case
Material flammability		UL94V-0
Weight		27g (0.95oz)
MTBF	MIL-HDBK-217F	300,000 hours
ENVIRONMENTAL SPECIFICATIONS		
Thermal performance	Operating ambient (See derating curve) Extended temp., option, See Note 1 Non-operating amb. Case Derating Cooling	-25°C to +60°C -40°C to +60°C -40°C to +95°C +95°C max. See derating curve Free air convection cooled
Relative humidity	Non-condensing	30% to 95%
Altitude	Operating Non operating	10,000 feet max. 40,000 feet max.
Vibration	5Hz to 500Hz	2.5G rms (approx.)

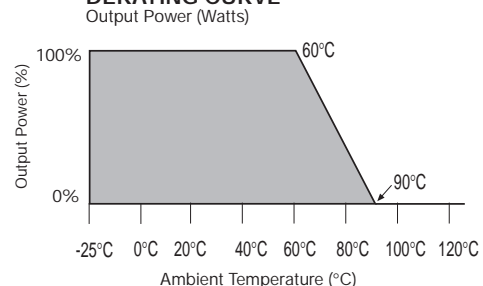
10 Watt Wide input DC/DC converters

INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	INPUT CURRENT	TYPICAL EFFICIENCY	REGULATION (TYP.)		MODEL NUMBER
					LINE	LOAD	
4.5-9VDC	2.1V	2000mA	1400mA	60%	±0.1%	±0.1%	MHP10-05S2V1 ⁽²⁾
4.5-9VDC	3.3V	2000mA	2095mA	63%	±0.1%	±0.1%	MHP10-0533V3 ⁽²⁾
4.5-9VDC	5.0V	1400mA	2058mA	62%	±0.1%	±0.1%	MHP10-05S05 ⁽²⁾
4.5-9VDC	12V	580mA	1856mA	75%	±0.1%	±0.1%	MHP10-05S12 ⁽²⁾
4.5-9VDC	15V	460mA	1769mA	78%	±0.1%	±0.1%	MHP10-05S15 ⁽²⁾
4.5-9VDC	±5.0V	±600mA	1764mA	68%	±0.1%	±1.0%	MHP10-05D05 ⁽²⁾
4.5-9VDC	±12V	±290mA	1784mA	78%	±0.1%	±1.0%	MHP10-05D12 ⁽²⁾
4.5-9VDC	±15V	±230mA	1769mA	78%	±0.1%	±1.0%	MHP10-05D15 ⁽²⁾
9-18VDC	2.1V	2000mA	583mA	60%	±0.1%	±0.1%	MHP10-12S2V1
9-18VDC	3.3V	2000mA	753mA	73%	±0.1%	±0.1%	MHP10-12S3V3
9-18VDC	5.0V	2000mA	1068mA	78%	±0.1%	±0.1%	MHP10-12S05
9-18VDC	12V	800mA	1025mA	78%	±0.1%	±0.1%	MHP10-12S12
9-18VDC	15V	660mA	1068mA	78%	±0.1%	±0.1%	MHP10-12S15
9-18VDC	±5.0V	±600mA	704mA	71%	±0.1%	±1.0%	MHP10-12D05
9-18VDC	±12V	±400mA	1025mA	78%	±0.1%	±1.0%	MHP10-12D12
9-18VDC	±15V	±300mA	1068mA	78%	±0.1%	±1.0%	MHP10-12D15
18-36VDC	2.1V	2000mA	291mA	60%	±0.1%	±0.1%	MHP10-24S2V1
18-36VDC	3.3V	2000mA	376mA	73%	±0.1%	±0.1%	MHP10-24S3V3
18-36VDC	5.0V	2000mA	534mA	78%	±0.1%	±0.1%	MHP10-24S05
18-36VDC	12V	800mA	512mA	78%	±0.1%	±0.1%	MHP10-24S12
18-36VDC	15V	660mA	528mA	78%	±0.1%	±0.1%	MHP10-24S15
18-36VDC	±5.0V	±600mA	347mA	71%	±0.1%	±1.0%	MHP10-24D05
18-36VDC	±12V	±400mA	512mA	78%	±0.1%	±1.0%	MHP10-24D12
18-36VDC	±15V	±300mA	528mA	78%	±0.1%	±1.0%	MHP10-24D15
36-72VDC	2.1V	2000mA	145mA	60%	±0.1%	±0.1%	MHP10-48S2V1
36-72VDC	3.3V	2000mA	180mA	73%	±0.1%	±0.1%	MHP10-483V3
36-72VDC	5.0V	2000mA	267mA	78%	±0.1%	±0.1%	MHP10-48S05
36-72VDC	12V	800mA	256mA	78%	±0.1%	±0.1%	MHP10-48S12
36-72VDC	15V	660mA	264mA	78%	±0.1%	±0.1%	MHP10-48S15
36-72VDC	±5.0V	±600mA	176mA	77%	±0.1%	±1.0%	MHP10-48D05
36-72VDC	±12V	±400mA	256mA	78%	±0.1%	±1.0%	MHP10-48D12
36-72VDC	±15V	±300mA	264mA	78%	±0.1%	±1.0%	MHP10-48D15

Notes

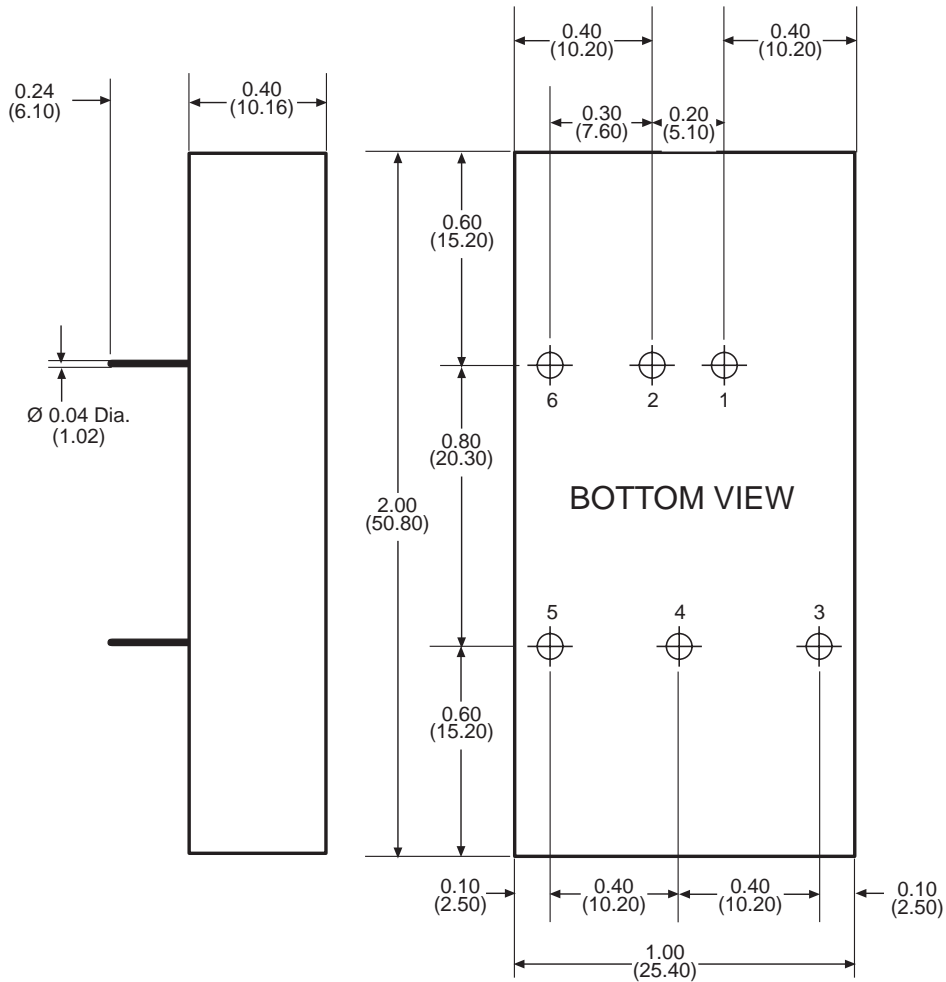
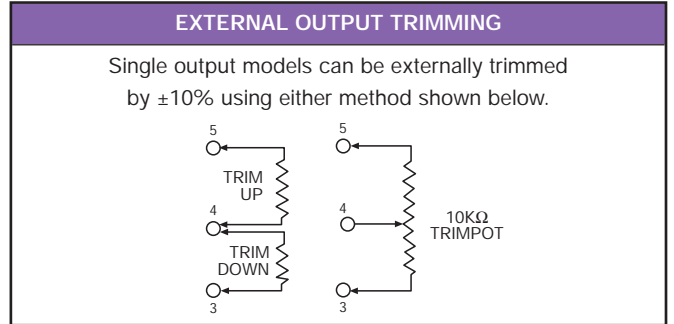
- Extended operating temperature range is available as an option. To specify a MHP10 that operates down to -40°C, add the suffix '-4' to the model number, e.g. **MHP10-24S05-4**.
- 5VDC input, max. 7 Watt output power.
- External trimming of the output voltage is optional on the single output units, add the suffix '-T' to the end of the model number, e.g. **MHP10-05S05-T**.
- Remote on/off is available as an option, add the suffix '-S' to the end of the model number, e.g. **MHP10-24D15-S**.
- 5VDC in max. for 1 minute.

DERATING CURVE



10 Watt Wide input DC/DC converters

PIN CONNECTIONS		
PIN NUMBER	SINGLE OUTPUTS	DUAL OUTPUT
1	+ Input	+ Input
2	- Input	- Input
3	+ Output	+ Output
4	N.C./Trim (Option)	Common
5	- Output	- Output
6	Control (Option)	Control (Option)



ALL DIMENSIONS IN INCHES (mm)
 Tolerance : ± 0.008 (0.2) max. on pin placement
 ± 0.02 (0.5) max. on outer dimensions